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Quiz 4

High Performance Computing I (WS 2016/2017)

Deadline: 21 November 2016, 2pm

Notice:

Please type your responses in a simple text file named "quiz04.txt" and submit it on our server *thales* using the following command:

```
thales$ submit hpc quiz04 quiz04.txt
```

Question 1

Formulate an algorithm for packing a block from matrix B in the GEMM operation

$$C \leftarrow \beta C + \alpha AB.$$

Question 2

Describe the algorithm of the GEMM micro kernel for computing $C \leftarrow \beta C + \alpha AB$ in terms of matrix-vector operations. Dimensions of A and B are $M_r \times k$ and $k \times N_r$, respectively.

Question 3

The GEMM macro kernel is supposed to compute $C \leftarrow \beta C + \alpha AB$ where C is a $m \times n$, A a $m \times k$ and B a $k \times n$ matrix. However, matrices A and B are assumed to being passed as packed matrices $\overline{A}$ and $\overline{B}$. For packing the constants M_c, K_c, N_c as well as M_r and N_r are relevant. You can assume:

- $m \leq M_c$, $k \leq K_c$ and $n \leq N_c$ holds for the dimensions of A, B and C.
- Zero-padding was used.

What are the dimensions of $\overline{A}$ and $\overline{B}$?